Wetlands as defined by the United States Fish and Wildlife Service (USFWS): "Land that has a predominance of hydric soils and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, hydrophytic vegetation adapted for saturated soil conditions."

Wetlands are among the most important natural resources found in Virginia's landscape. Most people think of wetlands as marshes, swamps and bogs, but wetland types are varied and not always easily identified. The broadest categories of wetlands are known as tidal and non-tidal, and they share many of the same functions.

Virginia's tidal wetlands are found along the shorelines of the Atlantic Ocean, the Chesapeake Bay, and the tidal portions of rivers and creeks. Vital to commercial and sport fisheries, they provide food and habitat to innumerable species that comprise Virginia's annual harvest of fish from tidal waters. The amount of plant food produced by these wetlands ranges between one and six tons per acre per year, rivaling the production level of intensively farmed agricultural areas.

These wetlands are important to the Atlantic Coast Flyway, serving as wintering and stopover grounds for migratory waterfowl including tundra swans and numerous varieties of ducks. They are home to herons, egrets, rails, snipe and others that depend on the food and shelter provided there. Freshwater tidal marshes in particular exhibit high diversity and provide habitat for many and varied birds, mammals and aquatic species.

Non-tidal wetlands are being recognized for their value to the environment and the economy. They are located in floodplains and adjacent to non-tidal rivers and streams. Non-tidal wetlands are located throughout all watersheds; they can be difficult to define because they are often fully forested and the ground is dry except in the winter months when the soil is saturated with groundwater and rainwater. These wetlands develop naturally in low areas that collect and cleanse water flowing though a watershed. They provide a first line of defense for water quality protection as stormwater runoff flows toward streams, rivers and bays. Where non-tidal wetlands are destroyed, increased stormwater runoff and silt from developing watersheds inundate the streams and rivers, which leads to the decline of water quality.

Wetlands function as the transitional feature between uplands and the aquatic environment. Due to their position in the landscape, they protect water quality through slowing the erosive force of stormwater released during rain events, providing flood control through storage of stormwater — thereby protecting life and property. They slowly release stored stormwater and groundwater to the surrounding streams and rivers; this function has particular value during times of drought.

Another very important wetland function is the filtering of nutrient enrichment and other pollutants in the stormwater that wetlands capture; therefore, wetlands protect local water supply through the filtering of both surface waters and groundwater. Dense wetland plants baffle flowing water, allowing suspended silt to be settled onto the wetland where it's captured by the growth of the root system. The silt particles carry pollutants such as phosphorus, which, in great quantities, can be harmful to the aquatic environment. Wetlands also are effective in capturing dissolved pollutants such as nitrogen; excess nitrogen can lead to algae overgrowth and eutrophication in the aquatic environment.

Wetlands offer critical habitat essential for the life-cycle of many species of wildlife, fish and aquatic organisms. Approximately thirty-five percent of the nation's rare and endangered species are found in wetland habitats; wetlands often contain unique plant communities and typically have high biodiversity. (Virginia Cooperative Extension, "Status of Wetlands Management," Broomhall and Kerns, Publication number 448-106)

A brief history of Virginia's wetland status

The USFWS has been mapping wetlands since the mid-1970s throughout the United States; this is known as the National Wetlands Inventory (NWI). Between 1956 and 1977 the USFWS estimates that Virginia lost more than 63,000 acres of coastal and inland wetlands. These losses were mainly in the coastal plain and averaged about 3,000 acres per year. The USFWS also determined that urban development was responsible for 43 percent of tidal wetlands loss during this period. Tidal wetlands were also lost to dredging projects, impoundments and sea level rise. Agriculture was cited as the principal source of non-tidal wetlands loss during this time, accounting for 45 percent of the total.

From 1982 to 1989, the U.S. Fish and Wildlife Service (USFWS) conducted a detailed study of wetland loss within the Virginia portion of the Chesapeake Bay Watershed, which encompasses 54 percent of Virginia. The study found that Virginia had a net loss in all wetland types and a net gain in ponds. Forested and scrub/shrub wetlands experienced the greatest loss during this time, totaling 19,284 acres. Most of these losses were due to reservoir construction, urban and rural development, and pond construction.

More recently, from 1994 to 2000, the USFWS studied rapidly developing southeastern Virginia (the study area was 811 square miles), and concluded that forested wetlands continued to experience the greatest losses (more than 3,300 acres) during the study period. This was mostly due to residential development.

Over the past three decades, a number of governmental programs have been established to reduce the destruction of wetlands. In adopting the Wetlands Act of 1972, the Virginia General Assembly established the policy to "preserve the wetlands and to prevent their despoliation and destruction." As a signatory to the Chesapeake Bay Agreement of 2000, Virginia adheres to a goal of no net loss of wetlands, with a long-term goal of gaining wetlands acreage and function.

Regulatory programs for wetlands management

Virginia's state agencies have responded to the heightened interest in protecting the value of wetlands by developing or implementing strategies to improve the conservation of wetlands through appropriate programs and activities. Wetlands are specifically managed by a variety of programs at each level of government. Wetlands regulatory programs have the most widespread effect on determining whether they are protected or lost. Other governmental programs substantially overlap with wetlands management. Examples include programs such as endangered species and those that manage specific activities, e.g. mining, agriculture, or road construction. These other programs are at times responsible for wetlands alteration.

Most wetland disturbing activities (usually associated with development of some kind) are regulated by federal, state, or local governments. Federal law has regulated activities in both tidal and non-tidal wetlands under Section 404 of the Clean Water Act (CWA). In Virginia, this task falls to the Norfolk District of the Army Corps of Engineers (Corps). This office has worked with the Virginia Marine Resources Commission and local wetlands boards to coordinate the 404 program with Virginia's tidal wetlands program. This coordination has allowed the development of consistent and predictable standards for compliance with tidal wetlands regulations.

Since 1989, the Virginia Department of Environmental Quality (DEQ) has managed the protection of non-tidal wetlands based on combined state and federal authority, providing stability to federal non-tidal wetlands regulations in Virginia. In 2001 the Corps issued a Section 404 of the Clean Water Act State Programmatic General Permit (SPGP) allowing the DEQ to assume a portion of the wetland impact permitting process from the Corps. Both agencies have regulatory authority over stream channels (waters of the US); therefore, impacts to stream features are brought into review under the SPGP as well.

According to state regulation *9 VAC 25-210-45*: All wetland delineations shall be conducted in accordance with the "Wetland Delineation Manual, Technical Report Y-87-1, January 1987, Final Report" (Federal Manual). The Federal Manual shall be interpreted in a manner consistent with the Corps.

It is the responsibility of the person seeking a permit for wetland impacts (permittee) to conduct a delineation; a Corps representative then confirms the wetland boundaries established by the delineation. It is important to note that all land disturbing activities should be initiated with a wetland scoping to determine if wetlands of any type exist within the project limits.

Any persons choosing to initiate development activity should contact an engineering or environmental firm that performs wetland delineations.

Non-regulatory programs: agriculture and forestry wetlands management

Under the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service's Field Office Guide, best management practices (BMP) have been developed that discourage clearing or draining wetlands and encourage compliance with Section 404 and 401 of the CWA. The federal 1985 Food Security Act and 1990 Food, Agriculture, Conservation and Trade Act (FACTA) include financial disincentives for farmers receiving any federal subsidy to clear or drain wetlands for agricultural purposes. The Wetlands Reserve Program, established by the 1990 FACTA, can reimburse Virginia's farmers for their efforts to protect non-tidal wetlands.

The 1993 Forestry Water Quality Law gives the Virginia Department of Forestry (DOF) authority to stop work and impose civil fines for silvacultural operations that are causing, or could potentially cause, water quality problems. This law has increased department foresters' responsibility to provide sound recommendations to loggers for on-site BMP application. It also has led to increased requests from loggers for pre-harvest BMP consultations with department staff. DOF has a coastal forestry engineer who specializes in wetlands protection and on-site recommendations for wetlands BMP application.

Mitigation of wetland losses

State mitigation non-tidal wetland requirements can be found under *9 VAC 25-670-70*. The regulations require compensation for wetland impacts. The type of mitigation can be either wetland creation or restoration. If neither creation nor restoration is an option, the permittee may purchase wetland credits from an established wetlands bank or pay into an approved in-lieu fee fund.

Compensation for wetland impacts is determined by the kind of wetland impacted. The compensation ratios are based upon wetland values and the degree of difficulty for creating the wetlands destroyed. Forested wetlands are very hard to successfully create and have significant benefit to water quality; therefore, they are mitigated at a 2:1 ratio of replacement to loss. Scrub/shrub wetlands are mitigated at a 1.5:1 ratio and emergent wetlands at a 1:1 ratio. Open water impacts (ponds and lakes) are 1:1.

State mitigation requirements for tidal wetlands can be found at 4 VAC 20-390-10. The criteria for mitigation requires that wetlands be preserved on-site in their natural state as

much as possible and to consider appropriate requirements for compensation only after it has been proven that the loss of the resource is unavoidable and that the project will have the highest public good and private benefit. Tidal wetland losses must be mitigated for at a 1:1 ratio.

Stream mitigation is more complex; a stream assessment must be conducted within the project area to determine the extent of the mitigation that will be required for impacts to both intermittent and perennial streams.

Wetland priorities for protection

In 1986, the U.S. Congress passed the Emergency Wetlands Resources Act, mandating the U.S. Fish and Wildlife Service and state agencies receiving Land and Water Conservation Funds to prioritize wetlands within each state. Information about this list may be found in the *Regional Wetlands Concept Plan, Emergency Wetlands Resources Act, Northeast Region*, 1990. U.S. Fish and Wildlife Service, Northeast Region. Hadley, Massachusetts.

Based on the findings of the USFWS through the NWI, tidal wetlands experienced the highest losses from the 1950s through the 1970s due to urbanization of the coastal plain; however, the regulatory programs for tidal wetland protection appear to have been effective and recent trends show a net gain in most tidal wetland types.

In more recent decades, Virginia has experienced significant population growth in many regions outside the coastal plain. Because of the population trends, forested and scrub/shrub non-tidal wetlands have been destroyed or converted to other wetland types at a 12-fold increase from the mid 1970s through the 1990s. This trend shows that Virginia is losing these wetland types faster than any other kind. As our knowledge of wetland function and value has improved, it has become apparent that both forested and scrub/shrub wetlands have immense value to the protection of Virginia's water quality and that the restoration or creation of these wetland types is the most challenging and costly.

For these reasons, non-tidal forested and scrub/shrub wetlands should have the highest priority for protection at this time.

Private efforts for wetland protection

As regulatory activities for wetland impacts evolved over the last 30 years, the concept of wetland banks and in-lieu fee funds developed to create a process that would allow wetlands to be replaced when lost to development activities.

Wetland banking became a reality in the 1990s when the Corps created guidelines for wetland bank creation in response to the requirements of federal and state mitigation for wetland impacts. Often it is not possible to create wetlands replacing those impacted within project limits, so steps were taken to establish a system where the permittee could purchase credits from an established bank and satisfy the permit requirement of wetland replacement. Since Virginia follows a "no net loss" directive, guidelines for wetland bank creation are as follows: wetlands are first restored, then created, enhanced, and in exceptional circumstances, preserved.

Banking is beneficial for several reasons: larger contiguous wetlands have improved function; wetland credits are purchased prior to the wetland impacts occurring; permit review timeframes are often reduced because compensation is readily available; and monitoring for wetland creation success is easier and success of creation higher in larger tracts.

The most successful wetland banks are created from prior converted croplands. Low floodplain areas that were once forested wetlands, which were converted to cropland for farming, are restored to their original condition; ground elevations are restored; seasonal flooding is allowed; and the floodplain is planted with appropriate vegetation. The area is then allowed to mature into functioning forested wetlands. Banks are created to restore tidal and non-tidal wetlands. The wetland types that are restored depend on the previous land use, topography, and available water from adjacent rivers, streams, and groundwater.

Wetland banking has become good business; landowners can now create banks on their farms, if they allow the bank to be placed within an easement. Landowners sell the available credits, thereby earning additional income and help protect water quality at the same time. The entire wetland bank is protected in perpetuity once all wetland credits are sold.

Another wetland compensation tool is the In-Lieu Fee Fund. This differs somewhat from a wetlands bank because these funds are managed by a public natural resource agency (the Corps in Virginia) or non-government organization that collects fees from the permittee for unavoidable wetland impacts. The collected fees are put into a fund that is used to purchase lands where the wetland/stream resources can be restored, enhanced or protected.

In 1995, the Corps and The Nature Conservancy (TNC) partnered to create the Virginia Aquatic Resources Trust Fund. This fund has been important in Virginia because stream restoration credits can also be purchased if other alternative compensation is not available. The Corps has final authority to commit to projects that the TNC proposes.

TNC devotes its resources to protecting unique and ecologically valuable areas. It has made a significant contribution to the preservation of Virginia wetlands. Two of its most notable preserves are the Great Dismal Swamp, managed by USFWS, and the Virginia Coast Reserve, a chain of 13 barrier islands located along the Eastern Shore of Virginia and managed by TNC. TNC continue to be a strong force in Virginia for the protection of all its valuable and rare natural resources

Ducks Unlimited, Inc. is another nonprofit organization interested in preserving critical habitats, specifically wetlands.

Although most of its acquisition efforts have been focused in Canada, Mexico and the northern midwestern states, a program initiated in 1985 called MARSH (Matching Aid to Restore States' Habitat) offers funds to all states for acquisition, preservation, protection and enhancement of wetlands. Ducks Unlimited works in Virginia with the Department of Game and Inland Fisheries to improve habitats throughout Virginia.

Virginia wetlands also may be preserved through conservation easements to state, county or city governments and to regional park authorities and, under the 1988 Conservation Easement Act, to certain qualified nonprofit organizations (for more on conservation easements, see Chapter III). The Department of Conservation and Recreation (DCR) Natural Heritage Program has acquired numerous natural area preserves that contain significant wetlands. Furthermore, many of the sites identified in the Natural Heritage Plan as priorities for protection include wetland acres.

Future protection efforts

DCR will pursue enhanced management of the Commonwealth's wetland resources. DCR is working to expand the natural areas registry program, which provides voluntary non-binding protection of exemplary natural areas to include many wetland systems. DCR also will continue to provide and expand appropriate ecological management of wetlands by coordinating multi-agency exotic species eradication programs, detailed hydrologic mapping and monitoring programs, prescribed burn research and restoration of endangered ecosystems and species.

DCR will continue to identify significant wetlands and other natural resources in western and southwestern Virginia. These areas are the most biologically diverse in the state, but have the fewest resources to identify and conserve natural areas. Lastly, DCR will provide management-planning data to localities to aid in protection of these resources.

Wetlands scientists from the Virginia Institute of Marine Science estimate implementing Virginia's tidal wetlands program in recent years has dramatically reduced the state's tidal wetlands loss. Virginia's "no net loss" policy continues to lower other wetland losses as well. The development of wetland banks and the in-lieu-fee program is moving Virginia towards balancing wetlands annual loss with wetlands gained.

Coordination among all levels of government will continue to be important for managing all wetlands. Coordination between state and federal wetlands regulatory programs is important to ensure efficient, predictable and consistent regulation. Coordination with local governments is important because local land-use decisions have a significant effect on the planned locations of development. If these decisions consider the values and locations of wetlands, they can reduce conflicts between landowner expectations and requirements of wetlands regulatory programs.

For further information about wetland programs in Virginia contact:

Department of Environmental Quality
P. O. Box 10009
Richmond, VA 23240-0009
www.deq.virginia.gov

Virginia Marine Resources Commission
2600 Washington Avenue
Newport News, VA 23607
www.mrc.virginia.gov

Department of Conservation and Recreation
Division of Soil and Water Conservation and
Chesapeake Bay Local Assistance Division
203 Governor Street
Richmond, VA 23219
www.dcr.virginia.gov

U.S. Army Corps of Engineers
Norfolk District Office
803 Front Street
Norfolk, VA 23510-1096
www.usace.army.mil

U.S. Fish and Wildlife Service
P. O. Box 480
White Marsh, VA 23183
www.fws.gov

Wetlands Program
Center for Coastal Resources Management
Virginia Institute of Marine Science
P.O. Box 1346
Gloucester Point, Virginia 23062-1346
Phone: 804 684-7380
www.ccrm.vims.edu